

Solar Powered DC Circulation Pump

Model TS5 15PV

Installation & Operating Instructions

General Information

This pump can be powered from any 12V source or directly from a PV Solar Panel. In Solar applications having the pump powered directly from a PV panel assures that the pump power is controlled by the intensity of the sun. This can completely eliminate the need for controllers, thermostats, and sensors. Since the pump can also be powered from 12V sources it is suitable for a host of applications in cars, boats, and RV's that require high temperature and pressure capability, or anywhere where connection of your plumbing system to hazardous grid power voltages is not desirable.

Areas of Use:

- Solar Water Heating Systems
- Hot Water Circulation
- Radiant Floor Heating
- Heat Transfer Applications
- 12V Operated Cooling Systems
- Liquid Transfer
- General Purpose Pumping

Main Features

- Brushless
- Sealless
- Advanced Magnetic Drive Technology
- Durable Permanent Magnet Rotor/Impeller
- Ceramic Shaft
- Can Operate Continuously
- Quiet Operation

Built-In Protective Functions

1. Drive Circuitry will sense dry operation and reduce pump output to prevent damage
2. The pump will slow operation or stop completely when it senses an overtemperature condition. This can arise due to excessive fluid temperature or excessive ambient temperatures. The pump will automatically recover when temperatures return to a safe level.
3. The pump is protected against overload conditions, such as can arise if the impeller is stuck due to debris.

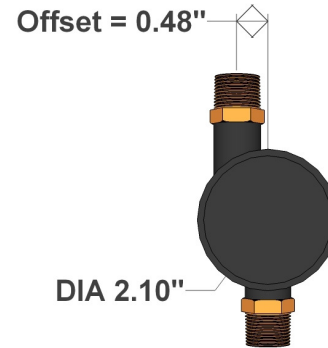
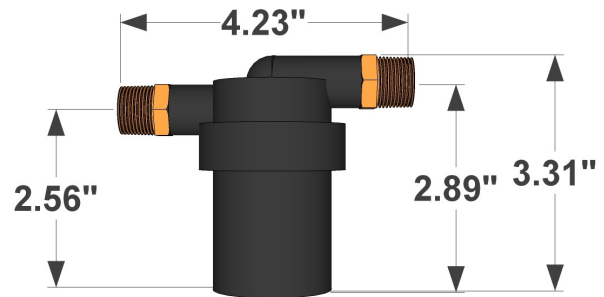
Materials

- Hi-Temp Food Grade Ryton Pump Body
- Threaded Brass Inlet/Outlet
- Viton "O" Ring
- Hi-Temp Ryton (PPS) Impeller
- Ceramic Ferrite Magnet

General Specs

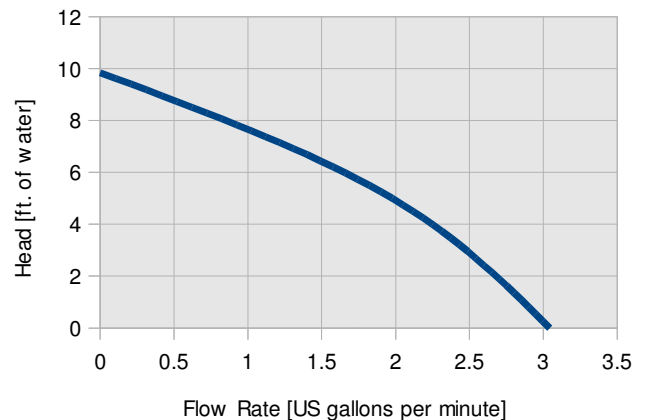
Voltage Range	8V-24V
Nominal Operating Voltage	12V
Maximum Fluid Temperature	212°F
Maximum Fluid Pressure	145 psi
Operating Noise	≤ 45dB
Minimum Start-Up Power	2 Watts
Maximum PV Panel Output Power	15 Watts
Maximum Head	10 ft.
Maximum Flow Rate	3 gpm

Dimensions



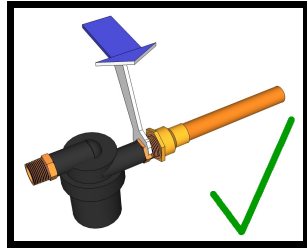
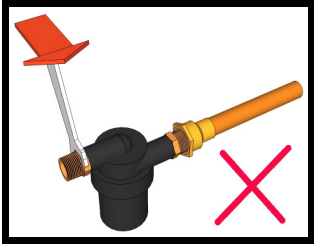
TS5 15PV Performance Characteristics

Fluid: Water at 72°F

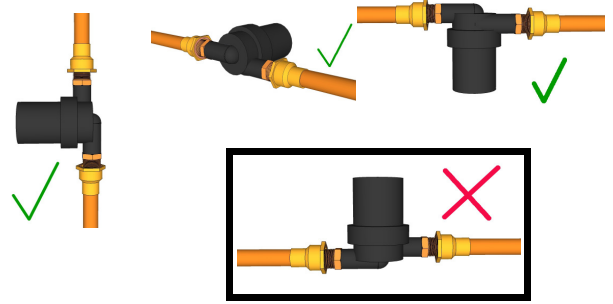


Installation Precautions

- When tightening the threads use the wrench on the side that is being tightened. If you use it on the opposite side you are relying on the pump body to transmit the tightening torque which will break the housing.



- Observe POLARITY! The red wire must be connected to the positive side of the power supply, and the black wire to the negative. Reversing polarity will **IMMEDIATELY DESTROY** the electronics in the pump
- Keep the outside of the pump body dry, and install such that moisture does not enter the electronics enclosure. Moisture in the electronics will quickly destroy the pump.
- Do not allow water inside the pump to freeze. The expansion of the ice will crack the pump housing
- There is a powerful magnet inside the pump. If your water contains small particles of iron or other magnetic materials they will eventually collect on the magnet and prevent the pump from operating at full efficiency.
- The maximum rated power of the pump is 15 Watts. Do not connect to any solar panel with an output power rating in excess of 15 Watts.
- The pump has a maximum voltage rating of 24V. Do not connect to any solar panel with an open circuit voltage rating (V_{oc}) in excess of 24V.
- If you are powering the pump from a battery only connect to batteries with a nominal voltage of 12V. Even though the maximum voltage rating is 24V connecting to 24V battery or other constant power source will overload the pump.
- The pump will not work if it has air in it. Also it cannot prime itself. For initial operation thoroughly purge the system of all air.
- Please observe the proper direction of installation. Installing the pump with the body pointing up will lead to faulty operation and premature pump failure. The pump body can be below the pipe, or on the side, but not above the pipe.



Startup Hints

- Make sure the system is purged of all air. Sometimes small bubbles will remain in the pump and cause noisy operation. Turning the pump off and on several times will usually purge the bubbles out of the pump.
- If you are running the pump from a PV panel it will take some time before the pump starts in the morning. PV panels will not produce enough power to run the pump until they receive full sun.

Troubleshooting

Symptom	Cause	Solution
Noisy operation	Air bubbles in the pump, Running Dry	Purge the air from the pump
Pump runs intermittently	dry running protection active	purge air from pump
	overtemperature protection active	wait until pump cools down
Pump won't run	Incorrect polarity	complete replacement
	moisture in electronics	
	input power insufficient	provide specified power supply
	dirt in the pump	clean inside of pump housing

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